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09/765,383	01/22/2001	Alex Dolgonos	7112	1036

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EXAMINER

SCHEIBEL, ROBERT C

ART UNIT

PAPER NUMBER

2666

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/765,383

**Applicant(s)**

DOLGONOS ET AL.

**Examiner**

Robert C. Scheibel

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☒ Claim(s) 32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the wireless communications links" in lines 1-2.

There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination, the examiner will assume that this phrase is supposed to be "the wired communications links" (connecting the hub and base stations in claim 5).

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 5, 7-8, 12-13, and 20-25 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent 6,038,450 to Brink et al.

Regarding claims **1, 12, 21, and 23**, Brink discloses the limitation of a wireless transmitter configured to transmit a data signal using multiple sub-carriers in the mobile units 22 of figure 2. Each of these transmitters is configured to transmit a data signal as successive OFDM symbols (see claim 12) as described by Brink in lines 12-21 of column 5. Brink discloses a plurality of base stations each configured to receive the multiple sub-carrier data signal and relay the multiple sub-carrier data signal to a hub station in the BSns 16a-c of Figure 1. The hub station is the MSC 18 of Figure 1 as will be described in more detail below. Regarding the additional limitation of claim 12 that the base stations are configured to receive OFDM symbols, Brink discloses this limitation from line 61 of column 5 through line 3 of column 6. In addition, the limitation that at least some of said base stations having overlapping coverage areas such that more than one base station can receive OFDM symbols from the same mobile transmitter is disclosed in lines 14-19 of column 6. The limitation of a hub station configured to receive and combine the multiple sub-carrier data signals from the plurality of base stations is disclosed in the MSC 18 of Figure 1 and described in lines 14-19 of column 6. The additional limitation of claim 12 that the hub station receive OFDM symbols from the base stations and demodulate the symbols and output an estimate of the data signals from the wireless transmitters is anticipated by Brink in the passages from lines 14-19 of column 6 and lines 28-30 of column 8. The passage from column 8 discloses sending OFDM symbols (multiple sub-carrier symbols) from the receiver in the base station (to the hub (MSC)). The hub (MSC) will inherently need to demodulate these symbols in order to be able to transmit them to the PSTN network.

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Further, the passage from column 6 indicates that the MSC will combine the symbols from multiple base stations (originating at the same mobile unit) and thus output an estimate of the signal sent by the originating mobile unit to the PSTN.

Regarding claim **2**, Brink discloses the limitation that the hub station (MSC) is configured to treat the signals received from the multiple base stations as multipath components in lines 38-40 of column 3 and 14-19 of column 6. The first passage indicates how the mobile unit combines the multiple signals by treating them as multipath components and the second passage indicates that the same combination of these signals in the uplink is done in the hub station (MSC) in an embodiment.

Regarding claim **3**, Brink discloses the limitation that the wireless transmitter uses an orthogonal frequency division modulation (OFDM) scheme to transmit portions of the data signal in parallel on multiple sub-carriers in lines 12-21 of column 7.

Regarding claims **5**, the limitation that at least some of the base stations are connected to the hub station by wired communications links in lines 14-17 of column 4.

Regarding claim **7**, the limitation that the system includes a plurality of wireless transmitters is disclosed in the multiple mobile units 22 of figure 1 described in lines 28-34 of column 4.

Regarding claims **8 and 20**, the limitation that at least some of the wireless transmitters transmit data signals substantially simultaneously, each using a unique set of sub-carriers in lines 60-64 of column 4.

Regarding claim **13**, the limitation that the hub station is configured to combine signals received from multiple different base stations is disclosed in lines 14-19 of column 6.

Regarding claim **22**, the limitation of outputting at the hub station, based on the combined data signals from the plurality of base stations, an estimate of the signals transmitted from the mobile wireless transmitter is disclosed in the passages from lines 14-19 of column 6 and lines 28-30 of column 8. The passage from column 8 discloses sending OFDM symbols (multiple sub-carrier symbols) from the receiver in the base station (to the hub (MSC)). The passage from column 6 indicates that the MSC will combine the symbols from multiple base stations (originating at the same mobile unit) and thus output an estimate of the signal sent by the originating mobile unit to the PSTN.

Regarding claim **24**, Brink discloses the limitation that the hub station is configured to perform a discrete Fourier transform on a sum of the OFDM symbols received from the base stations in the DFT 72 of Figure 3 and lines 15-17 of column 7. It is clear that the hub station (MSC) would have to have a receiver somewhat similar to that of Figure 3 to properly receive the OFDM symbols sent from the base stations.

Regarding claim **25**, Brink discloses the limitation that each of the base stations is connected to the hub station by a substantially independent communications link in Figure 1 where each of the links 30 appear to be separate (independent) wired links.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent 5,568,205 to Hurwitz.

Brink discloses all the limitations of the parent claim 1 as indicated in the rejection above. Brink does not disclose expressly the limitations of claim 4. Hurwitz discloses an electronic news gathering system (see lines 34-50 of column 2), including a video camera and audio transducer (see element 17 of Figure 2) coupled to the wireless transmitter (element 82 of Figure 5), the wireless transmitter being configured to receive video and audio signals from the video camera and audio transducer for

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inclusion in the data signal (see Figures 2 and 5). Brink and Hurwitz are analogous art because they are from the same field of endeavor of wireless transmission of audio and video. At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the mobile unit of Brink to transmit audio and video as described in Hurwitz. The motivation for doing so would have been to allow remote news gathering as suggested by Hurwitz in lines 11-26 of column 1. Therefore, it would have been obvious to combine Hurwitz with Brink for the benefit of remote news gathering to obtain the invention as specified in claim 4.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al.

Brink discloses all the limitations of the parent claim 5 as indicated in the rejection above. Brink does not disclose expressly the limitations of claim 6. However, it would have been obvious to one of ordinary skill in the art to use an optical cable to link the base stations and the hub (MSC) for the benefit of increased bandwidth as is well known in the art. Official notice is taken.

9. Claims 9-10 and 17-18, are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent 5,742,907 to Brown.

Brink discloses all the limitations of the parent claims 8 and 12 as indicated in the rejection above. Brink does not disclose expressly the limitations of claims 9-10 and 17-



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18. Brown discloses the limitation that wireless transmitters each include a receiver for receiving a reference signal to synchronize operation of the wireless transmitters in the GPS reference clock of sites s1 and s2 of figure 2. Brown further discloses the limitation that the reference signal receiver is a Global Positioning System (GPS) receiver in figure 2 as well. Brink and Brown are analogous art because they are from the same field of endeavor of wireless communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Brink by adding a GPS receiver to the mobile units to produce a reference signal for synchronization. The motivation for doing so would have been to synchronize the transmitters to a common reference as suggested in the abstract. Therefore, it would have been obvious to combine Brown with Brink for the benefit of synchronizing to a common reference to obtain the invention as specified in claims 9-10 and 17-18

10. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent 6,515,960 to Usui et al.

Brink discloses all the limitations of the parent claim 7 as indicated in the rejection above. Brink does not disclose expressly the limitations of claim 11. Usui discloses the limitation at least some of the wireless transmitters transmit data signals using the same sub-carriers in different time intervals in the combination of OFDM and TDMA described in the abstract. Brink and Usui are analogous art because they are from the same field of endeavor of wireless communications. At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify

Brink by allowing multiple subscribers to use the same sub-carriers in different times. The motivation for doing so would have been to allow for the transmission of timing to be set without the use of a number of synchronization bits as suggested by Usui in lines 55-59 of column 1 and lines 5-24 of column 11. Therefore, it would have been obvious to combine Usui with Brink for the benefit of setting the timing of transmission more easily to obtain the invention as specified in claim 11.

11. Claims **14-16 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent Application Publication 2001/0004379 to Wilson.

Brink discloses all the limitations of the parent claims 13 and 25 as described in the rejection above. Brink does not disclose expressly the limitations of claims 14-16 and 26. Wilson discloses the limitation of claim 14 of the hub station being configured to sum the OFDM symbols received from the base stations prior to demodulating the OFDM symbols in figure 2. Wilson discloses the limitation of claims 15 and 26 of the links from the base stations to the hub station having predetermined propagation delays and the hub stations including buffering to eliminate the delay spread prior to combining in paragraphs 10-12 on page 1. Wilson also discloses the limitation of claim 16 of hub station being configured to adaptively combine the signals received from each of the base stations based on measured signals characteristics in paragraphs 14 and 15 on page 1, where the phase rotation is the signal characteristic. Brink and Wilson are analogous art because they are from the same field of endeavor of wireless

communications systems. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the concepts of Wilson to combine the signals in the hub station (MSC) of Brink. The motivation for doing so would have been to avoid extra memory as suggested by Wilson in paragraph 11 on page 1. Therefore, it would have been obvious to combine Wilson with Brink for the benefit of reduced memory requirements to obtain the invention as specified in claims 14-16 and 26.

12. Claims **27-28** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al.

Brink discloses all the limitations of the parent claim 25 as described in the rejection above. Brink does not explicitly disclose the limitations of claims 27 and 28. However, in Figure 3, Brink discloses a receiver which performs a discrete Fourier transform (DFT 72) and then later combines the transformed symbols (combiners 82) which as specified in lines 13-15 of column 8 can be multipath versions of the same sub-carriers. Brink further discloses the limitation of claim 28 that the hub station is configured to combine the transformed symbols based on noise characteristics of signals received from the independent wired links in lines 57-62 of column 2. It would have been obvious to one of ordinary skill in the art to apply the same concepts to the receiver/combiner in the hub station (MSC) so that the symbols are first transformed and then combined. The motivation for doing so would have been to combine symbols from multiple base stations as suggested by Brink in lines 14-19 of column 6.

Therefore, it would have been obvious to modify Brink to obtain the invention as specified in claim 27.

13. Claims **19 and 29-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent Application Publication 20020027957 to Paulraj.

Brink, modified, discloses the limitations of claims 12 and 27 as described in the rejection above. Brink does not disclose expressly the limitations of claims 29-30.

Paulraj discloses the limitation of the wireless data signals including training symbols in the training patterns of figure 10a, 10b, and 11. Paulraj discloses the limitation that these training signals are used to determine which base stations have received a transmission using the training symbols in paragraph 30 on pages 2-3 which indicates that the training patterns are distinguishable by the receiver (the hub station) and thus could be used to determine if a particular transmitter's signal has been received at a given base station. Paulraj further discloses the limitation of claim 30 that the training symbols are predetermined pseudo-random symbols in paragraph 9 on page 6; it is well known that Walsh codes are predetermined pseudo-random symbols. Brink and Paulraj are analogous art because they are from the same field of endeavor of wireless communications systems. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Brink by using the training patterns as indicated by Paulraj for the benefit of improving interference mitigation (as specified by Paulraj in the abstract) to obtain the invention as specified in claims 19 and 29-30.

14. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,038,450 to Brink et al in view of U.S. Patent Application Publication 20020027957 to Paulraj and in further view of U.S. Patent Application Publication 20030195017 to Chen et al.

Brink, modified, discloses the limitations of claim 29 as described in the rejection above. Brink does not disclose expressly the limitations of claim 31. Chen discloses the limitation of claim 31 of the training symbols comprise OFDM symbols having predetermined characteristics distinguishable from OFDM symbols used to transmit useful data, the hub station being configured to determine the presence of the training symbols by determining if the signal power of sub-carriers associated with the at least one wireless transmitter exceed a threshold value in the threshold T\_ADD of paragraph 9 on page 1. Brink and Chen are analogous art because they are from the same field of endeavor of wireless communications systems. At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify Brink to use a threshold on the pilot signal to determine the presence of a transmitter. The motivation for doing so would have been to properly establishing and tearing down the backhaul channels in a soft handoff as suggested by Chen in paragraph 9 of page 1. Therefore, it would have been obvious to combine Chen with Brink, modified, for the benefit of properly handling the backhaul channels in a soft handoff to obtain the invention as specified in claim 31.

***Allowable Subject Matter***

15. Claim 32 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. There may also be other allowable subject matter in the claims; examiner recommends that the applicant amend the independent claims to indicate the intended use of the system in and Electronic News Gathering environment and that more details of the operation of the base station and the hub station be added to overcome the prior art.

***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Application Publication 2002/0001316 to Hornsby et al and U.S. Patent 6,396,803 to Hornsby et al disclose a system similar to applicant's where OFDM is used in the downlink only.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 703-305-9062. The examiner can normally be reached on 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*RCS 7-14-04*  
Robert C. Scheibel  
Examiner  
Art Unit 2666



DANG TON  
PRIMARY EXAMINER